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BEAR CREEK WATERSHED ASSESSMENT

Western Shasta Resource Conservation District



Confluence of Bear Creek and the Sacramento River.

AWARD AMOUNT

\$140,806

WATERSHED

Bear Creek and Ash Creek Watersheds

COUNTY

Shasta County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 2, State Senate: 4

PURPOSE

Conduct a watershed assessment for Bear Creek and Ash Creek watersheds

PROJECT GOALS

- ✧ Gather existing data including water, geology and soils, erosion, hydrology, vegetation, fisheries, wildlife, human uses, and fire and fuels
- ✧ Identify data gaps where additional information is needed
- ✧ Determine if watershed conditions may be limiting beneficial water uses and/or anadromous and resident fish populations
- ✧ Document findings in a watershed assessment document to be used as the basis for a comprehensive watershed management plan

Benefits to the Bay-Delta System

The value of streams such as Bear Creek can be integral and valuable in restoring ecological health to the Bay-Delta system, particularly for steelhead trout and fall-run Chinook salmon. Implementation of this project is an important step toward this restoration. A cooperative program with water users for a mutually acceptable flow schedule, that not only provides protection for downstream migrating salmon and steelhead, but also recognizes the needs of agriculture, will provide multiple benefits locally and downstream. By documenting existing conditions in the Bear Creek watershed, decision-makers and managers can make better-informed decisions regarding the use of water and natural resources in the watershed and provide the needed data to work toward a cooperative agreement that would benefit both fish and agricultural water users.

PROJECT OVERVIEW

Bear Creek is a small eastside tributary that enters the Sacramento River 5 miles below the town of Anderson. The watershed historically supported anadromous fish species such as salmon and steelhead. However, the limited runoff in this small stream makes it difficult to meet the instream flow needs of both anadromous fish and agricultural water demands simultaneously, especially in below-normal water years.

The Bear Creek watershed community began meeting in late 2001 to address instream flow needs and degraded water quality conditions. Residents of the community soon formed the Bear Creek Coordinated Resource Management Plan (CRMP) and agreed on the need for a watershed assessment. Ash Creek, a small tributary between the Bear Creek and Battle Creek watersheds that enters the Sacramento River just south of Bear Creek, is included in the assessment. The watershed assessment will focus on land use, hydrology, water quality, stream channel morphology, fisheries and aquatic habitat, sediment sources, and recreation. The watershed assessment will provide basic information for a comprehensive watershed management plan and will support future implementation projects.

Public meetings, quarterly newsletters to property owners and interested residents, and articles and public service announcements to the local media will supplement the watershed assessment and improve communication throughout the watershed.



The headwaters of Bear Creek: Thatcher Meadow and Latour Butte.

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CLEAR LAKE WATERSHED MERCURY AND NUTRIENT ASSESSMENT

Lake County Watershed Protection District



Sediment sampling in Eight Mile Glade.

PURPOSE

Determine mercury and nutrient inputs to Clear Lake to support the development and implementation of water quality protection measures

PROJECT GOALS

- ✧ Estimate average annual mercury and nutrient input (loads) to Clear Lake
- ✧ Develop an adaptive water quality monitoring program
- ✧ Identify sources of mercury within the watershed
- ✧ Provide data for use in implementation of Clear Lake Mercury Total Maximum Daily Load (TMDL) and support the implementation of the Clear Lake Nutrient TMDL
- ✧ Coordinate the monitoring and assessment program with local property owner groups, local organizations, Native American tribes, the USDA Natural Resources Conservation Service, and the Central Valley Regional Water Quality Control Board (CVRWQCB)

AWARD AMOUNT

\$147,182

WATERSHED

Cache Creek Watershed

COUNTY

Lake County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 1, State Assembly: 1, State Senate: 2

Benefits to the Bay-Delta System

Clear Lake is the headwaters of Cache Creek, a tributary to the Sacramento River and the Bay-Delta. This project provides direct benefits to wildlife and human health by identifying watershed mercury sources to Clear Lake and determining solutions to reduce mercury in the lake and the Bay-Delta. The project also provides benefits to local residential, recreational, and commercial interests by facilitating programs to reduce nutrient loads and eliminate seasonal algal blooms, which affect tourism and sport fishing. Implementation of this project will benefit five Native American tribes who use resources of the lake and watershed, local business owners, tourists, sport fishermen, and the East Lake and West Lake Resource Conservation Districts by improving the water quality of Clear Lake. The general public benefits from this project through the implementation of Total Maximum Daily Loads (TMDLs) in cooperation with the CVRWQCB and the U.S. Environmental Protection Agency.

PROJECT OVERVIEW

Clear Lake is located in the central Coastal Range of Northern California and is the headwater of Cache Creek, which is a tributary to the Sacramento River and the Bay-Delta. Historical mercury mining activities in the watershed have increased mercury loads entering the lake. Nutrient loads to the lake, particularly phosphorus, have caused seasonal algal blooms despite improved erosion control management. The mercury and nutrient loads have impaired the beneficial uses of Clear Lake, including fishing, recreation, and fish and wildlife habitat. In an effort to restore these beneficial uses, the CVRWQCB has adopted a Clear Lake Mercury TMDL and is developing a Clear Lake Nutrient TMDL to reduce the mercury and nutrient loading to Clear Lake.

The Lake County Watershed Protection District is determining mercury and nutrient loads to Clear Lake to support TMDL development and implementation. The District works in coordination with the CVRWQCB with input from local property owner groups, local resource conservation districts, Yolo County, the Cache Creek Conservancy, five Native American tribes, the Delta Tributary Mercury Council, and the USDA Natural Resources Conservation Service. The project quantifies mercury and nutrient loading from major tributaries to the lake by collecting water quality samples at multiple times during the year and at varying flow regimes. The project also collects additional water quality samples throughout the watershed to identify mercury hotspots. The monitoring program will be evaluated at the end of each sampling period and revised, if necessary, in cooperation with the CVRWQCB. Public meetings encourage volunteer participation and provide opportunities for public input.



Stream sampling in the upper watershed.

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COLFAX COMMUNITY WATERSHED AND FIRE SAFE ECOSYSTEM PROJECT

City of Colfax



Foresthill shaded fuel break demonstration site before treatment.

PURPOSE

Protect urban areas within the Bear and American River watersheds from fire dangers while recognizing the natural fire ecology of the Sierra Nevada

PROJECT GOALS

- ✦ Implement a network of shaded fuel breaks at the urban-wildland interface
- ✦ Protect urban areas and residents from fire dangers
- ✦ Determine the impact of fuel reduction measures on water quality
- ✦ Implement a region-wide approach to accommodating the natural fire cycle
- ✦ Educate the public about fire management strategies

AWARD AMOUNT

\$99,700

WATERSHED

Upper Bear River and North Fork American River Watersheds

COUNTY

Placer County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 4, State Assembly: 4, State Senate: 1

Benefits to the Bay-Delta System

The American River and the Bear River originate in the Sierra Nevada and provide a significant amount of flow to the Sacramento River and the Bay-Delta. Excess fuel loads (vegetation) within these watersheds, because of historical fire suppression policies, have created conditions that can lead to very hot, catastrophic fires, rather than to a natural cycle of frequent, moderate fires. These fires have severe impacts on urban development and the soil, air, and water resources in these watersheds. This project will provide direct benefits to urban and suburban developments and will promote improved soil, air, and water resources within these watersheds by developing a regional approach to the natural fire cycle. Improved fire management will also benefit water quality in the Bay-Delta by reducing sediment and pollutant loading from severely burned areas. Recreation, water supply, wildlife, and plant communities of these watersheds also benefit in the long term with reduced fuel load, more frequent, moderate fires, and a more natural fire ecology.

PROJECT OVERVIEW

The American River and the Bear River originate in the Sierra Nevada and flow into the Sacramento River and ultimately into the Bay-Delta. Historical fire suppression has affected the quantity of vegetation (or fuel loading) within the American River and Bear River watersheds and the watershed ecosystems that are dependent on a natural cycle of frequent, moderate fires. Catastrophic fires are more likely to damage urban areas and the extensive development along the urban-wildland interface. Because the American River is a major tributary to the Sacramento River, impacts on water quality in these watersheds substantially affect the water quality of the Sacramento River and the Bay-Delta.

The City of Colfax is collaborating with the Ponderosa Fire Safe Council, the American River Watershed Group, the American River Watershed Institute, and established stakeholder forums to develop a fire management plan to protect urban communities from catastrophic fires and reduce potential water quality impacts resulting from these fires. Vegetation assessment and fire modeling in the Ponderosa Fire Safe Council project area will provide a basis for the fire management plan. The assessment and modeling will determine current fuel load and inform the project team of optimal areas to implement shaded fuel breaks. This project develops a GIS database of the ecological and geological features of the watersheds. A network of shaded fuel breaks constructed by individual private landowners will further separate urban development from wildland areas and accommodate the natural fire cycle. Citizen monitoring conducted prior to and following implementation of each shaded fuel break will evaluate the potential short-term impacts on water quality. This project includes a media tour of the completed shaded fuel breaks at which information about fire management strategies will be disseminated to the general public.



Foresthill shaded fuel break demonstration site after treatment.

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COTTONWOOD CREEK WATERSHED STRATEGY

Cottonwood Creek Watershed Group



An example of erosion that occurs each year during storm events on Cottonwood Creek. Such erosion will be addressed in the lower 12 to 15 miles of the channel.

PURPOSE

Develop a watershed management strategy based on the watershed assessment and stakeholder participation

PROJECT GOALS

- ✿ Identify watershed management objectives
- ✿ Recommend specific management or restoration actions
- ✿ Build capacity of the Cottonwood Creek Watershed Group to coordinate management, restoration, and monitoring activities

AWARD AMOUNT

\$200,000

WATERSHED

Cottonwood Creek Watershed

COUNTY

Shasta County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2 and 3, State Assembly: 2, State Senate: 4

Benefits to the Bay-Delta System

The Cottonwood Creek watershed is a tributary to the Sacramento River, which is a significant water supplier to the Bay-Delta and an integral component of the Bay-Delta system. Ecosystem health and water quality within the Bay-Delta are dependent on the quality of water from upstream areas. This project will develop a comprehensive management strategy for the Cottonwood Creek watershed. Restoration projects that stem from the management plan will result in improved habitat, water quality, and water supply reliability. These improvements will directly benefit fish and wildlife as well as the local community. Implementation of this project will also provide benefits to the Bay-Delta, predominantly through salmonid habitat and water quality improvements. Although Cottonwood Creek is located many miles from the Delta, its status and health are ultimately reflected in the health of the Delta.

PROJECT OVERVIEW

Cottonwood Creek is the largest undammed tributary on the west side of the Sacramento Valley. It drains an area of 930 square miles and enters the Sacramento River just downstream of the Redding/Anderson area. Cottonwood Creek watershed supports a number of sensitive species, including Chinook salmon, steelhead trout, northern spotted owls, and foothill yellow-legged frogs. Many studies have been conducted in the past on the creek's hydrology and sediment transport process. Additionally, the Cottonwood Creek Watershed Group (CCWG) recently completed an assessment of the entire watershed. CCWG is a nonprofit organization composed of landowners, business owners, agency representatives, and other local stakeholders. Building on this assessment, the CCWG is now working on a comprehensive management strategy for the watershed.

The watershed management strategy describes the desired condition of the watershed and outlines watershed management activities aimed at achieving that condition. The plan also provides direction for future watershed management activities, including those conducted by public agencies and private interests. The plan is being developed through an active public outreach/stakeholder involvement process and focuses on the following issue areas: erosion and sedimentation, flooding, rangelands, timber, green belts/riparian corridors, aquatic habitats, terrestrial habitats, groundwater, and water quality.



A pond left behind from the days of placer mining. Property owners are removing the piles of rock and plan to restore the area.

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DEER CREEK WATERSHED EROSION AND SEDIMENT CONTROL PROJECT—PHASE II IMPLEMENTATION

Deer Creek Watershed Conservancy



Crossing before: Failing 25-year-old log stringer bridge at Swamp Creek, an intermittent tributary to Deer Creek (photo courtesy of Collins Pine Company and USFS).

PURPOSE

Reduce sediment discharge into Deer Creek by implementing nine restoration projects

PROJECT GOALS

- ✧ Maintain the high quality of Deer Creek water by managing roads and watercourse crossings to reduce excess erosion and sedimentation
- ✧ Maintain viable anadromous fish spawning and rearing habitat

AWARD AMOUNT

\$493,175

WATERSHED

Deer Creek Watershed

COUNTY

Tehama County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 3, State Assembly: 2, State Senate: 4

Benefits to the Bay-Delta System

Watershed planning through the locally driven Deer Creek Watershed Conservancy will help to preserve and restore spring-run Chinook salmon and steelhead trout and other important attributes of the watershed. In addition to providing direct benefits to the creek's fish populations, the improved water quality resulting from this project will also benefit Deer Creek's water users, and ultimately contribute to a healthier Bay-Delta.

PROJECT OVERVIEW

Deer Creek is a secondary tributary to the Sacramento River. The watershed drains 200 square miles and is 60 miles long. Deer Creek is home to highly valued populations of spring-run Chinook salmon and steelhead, as well as populations of other Chinook salmon and resident native fish. It contributes valuable surface water for agriculture, recreation, and fish and wildlife habitat. The watershed also provides timber resources for both private companies and the U.S. Forest Service.

The Conservancy participated in a comprehensive, systematic road and sediment source survey of Deer Creek in 1996. The survey identified the major sediment-producing sites in the upper watershed. This study found sediment yields were highest from sources related to roads, and were tied closely to geology. The greatest yields were from areas underlain with rhyolite and dacitic pyroclastic rocks. As a result of the survey, 44 significant sites were identified and prioritized.

This project implements restoration projects in nine of the 44 identified sites within a 3-year timeframe. Work includes upgrading culverts to meet 100-year flows, installing structures at stream-crossings to improve fish passage and reduce the potential for crossing failure, and narrowing roads and improving drainage on roads to reduce sedimentation and erosion. This implementation project is carried out by the Deer Creek Watershed Conservancy, a nonprofit organization composed of many different stakeholders. The project stems from the organization's comprehensive watershed management plan, which was completed in 1998.



Crossing after: Log stringer bridge has been replaced with an 8-foot-high, 12-foot-wide squashed culvert (photo courtesy of Collins Pine Company and USFS).

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A guest speaker from the USGS discusses federal programs during a field day at one of the project's research/demonstration sites.

AWARD AMOUNT
\$275,000

WATERSHED
Lower Sacramento River Watershed

COUNTY
Glenn County

CALFED REGION
Sacramento Valley Region

LEGISLATIVE DISTRICTS
US Congress: 3, State Assembly: 2, State Senate: 4

PURPOSE

Continue a pesticide and water quality management education program to enable and empower growers to effectively reduce water quality problems associated with orchard runoff

PROJECT GOALS

- ✧ Provide education to growers about orchard management practices that reduce pesticide use and pesticide runoff
- ✧ Maintain demonstration buffer strip sites as working nonpoint-source pollution reduction models for growers
- ✧ Establish a demonstration site to examine feasibility of rice straw compost as a water quality management strategy
- ✧ Conduct a study to measure and quantify the amount of pesticide that drifts off site after typical orchard application (referred to as regional atmospheric deposition)

Benefits to the Bay-Delta System

Water quality tests of the surface waters in the Central Valley and Bay-Delta system repeatedly have found pesticide levels toxic to aquatic life. The highest concentrations of pesticides in surface water are attributed to orchard runoff. The Glenn County Surface Water Stewardship program develops a pesticide/water management education program to promote awareness among local growers about cost-effective best management practices to reduce pesticide runoff and other nonpoint-source pollution from their orchards. This project benefits local surface waters and the Bay-Delta system by teaching growers how to keep downstream waters safe for aquatic life and beneficial uses, and by performing research to fill in data gaps related to pesticide dispersal and pesticide remediation techniques. It also benefits the local growers by demonstrating cost-effective management strategies that create sustainable orchards, as well as help meet water quality compliance regulations.

PROJECT OVERVIEW

The Glenn County Surface Water Stewardship program addresses nonpoint-source pollution associated with pesticide, sediment, and nutrient runoff from orchards. It expands existing outreach, education, research, and water quality management programs. The project develops pesticide and water management education with field days, farm tours, newsletters, and the media. It provides environmental education and promotes local grower awareness of cost-effective best management practices to reduce nonpoint-source pollution.

This project establishes two demonstration orchards to provide essential information to landowners on best management practices that reduce nonpoint-source pollution associated with runoff after winter storm events. The demonstration orchards (almond) will use and compare different types of vegetative buffer filter strips. Each site includes land preparation, herbicide use, fertilization, seed sowing, and irrigation practices. Each will have a control area that will be studied for a minimum of three years to assess management-measure effectiveness. Another demonstration will examine the feasibility of using rice straw compost as a management strategy to remediate soil that has been exposed to pesticides.

The project involves additional research to measure and quantify the amount of pesticide that drifts off site after typical orchard application. This reconnaissance study assesses the deposition of pesticides on soil and water surfaces relative to local pesticide application and to ambient regional sources. When complete, the project will help fill research data gaps and demonstrate practical, cost-effective means for farmers to control or mitigate off-site pollution.



At this research/demonstration site, planted native grasses act as a buffer strip and control area with an auto sampler to catch water runoff.

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INVENTORY, ERADICATION, AND MONITORING OF INVASIVE SPECIES

Lake County Watershed Protection District



One of the 108 locations of *Arundo donax* along the shores of Clear Lake.

PURPOSE

To educate the public about *Arundo donax* and *Tamarix* spp., two invasive plant species of concern; to inventory and eradicate the plants; and to monitor the effectiveness of eradication

PROJECT GOALS

- ✧ Eradicate *Arundo donax* in the project area
- ✧ Inventory *Tamarix* spp. for future eradication efforts
- ✧ Restore riparian habitat
- ✧ Work with local watershed groups to increase public awareness of invasive species and how they affect riparian function

AWARD AMOUNT

\$181,262

WATERSHED

Cache Creek and Putah Creek Watersheds

COUNTY

Lake County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 1, State Assembly: 1, State Senate: 2

Benefits to the Bay-Delta System

Nonnative species removal is critical to the health of the state's water systems. The health of the upper Cache and Putah Creek watersheds can be improved by reducing wildfire fuels and minimizing sediment input to the stream by implementing practices to protect streamflows, stream channels, and riparian habitat. Efforts to control or eradicate *Tamarix* spp. and *Arundo donax* infestations in these watersheds will allow natural vegetation succession by native plant species. Direct benefits include decreased wildfire threat, enhanced riparian corridors and habitat, and overall improved watershed health. Each of these benefits contributes to improved water quality, reduced water use by water-sucking nonnative plants, and improved discharge to the Bay-Delta system.

PROJECT OVERVIEW

Lake County contains the headwaters of Cache Creek and Putah Creek. Both watersheds are plagued by two invasive plant species - *Arundo donax* and *Tamarix* spp., which are listed among 100 of the “world’s worst invaders” in the Global Invasive Species Database. Once established, these species displace native riparian vegetation and provide poor habitat for terrestrial insects and wildlife. *Arundo donax* and *Tamarix* spp. trap sediments and narrow flood channels, leading to accelerated erosion and overbank flooding. *Arundo donax* is prone to wildfire and debris blockages that often lead to public and private infrastructure damage. Additionally, because *Tamarix* spp. develops a very dense root system that can reach 30 feet in depth, it lowers the water table, causing native vegetation disappearance and the soil salt chemistry to change.

This project builds on previous eradication efforts undertaken by the County over the past three years, including identifying, mapping, and eradicating primary sources of *Arundo donax*. Volunteers using a variety of cutting methods continue eradication efforts. *Tamarix* spp. site information is collected concurrently with site information for *Arundo donax*. The information is put into a Geographic Information System (GIS) database for future eradication. Surveying and monitoring protocols have been developed and used for collecting site information and monitoring success of eradication projects. This project also includes the development of a revegetation plan and an invasive species management plan, including a public outreach and education strategy.



Active watershed groups making a difference in Scotts Valley.

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LOWER CLEAR CREEK SPAWNING GRAVEL INJECTIONS

Western Shasta Resource Conservation District



Lower Clear Creek gravel injections site at Placer Bridge.

PURPOSE

Increase the amount of in-channel gravel substrate available in Lower Clear Creek to address a limiting factor for anadromous salmonid production

PROJECT GOALS

- ✧ Increase instream spawning and rearing habitat for anadromous fish (Chinook salmon and steelhead trout)
- ✧ Monitor gravel movement
- ✧ Improve channel and floodplain ecological functions

AWARD AMOUNT

\$335,489

WATERSHED

Clear Creek Watershed

COUNTY

Shasta County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 2, State Senate: 4

Benefits to the Bay-Delta System

This project increases the instream spawning gravel substrate to improve salmonid production and provides improvements to the channel floodplain and ecological functions of the Lower Clear Creek watershed. Clear Creek, located in Shasta County, is an important tributary to the Sacramento River. Gravel enhancements in Clear Creek will provide spawning habitat from Whiskeytown Dam to the Sacramento River. This project fosters local efforts in watershed management. The restoration work has involved the cooperative efforts of numerous federal, state, and local agencies, local landowners, and Native American tribes, who will benefit from the restoration of anadromous salmonid habitat in the watershed. Restoration efforts can lead to significant increases in fall-run Chinook salmon spawning populations. The local economy will benefit from this project, as it has been estimated by the U.S. Department of Agriculture that each salmon caught in the Sacramento River generates \$1,000 in local revenues.

PROJECT OVERVIEW

Lower Clear Creek has been identified as an important stream for anadromous fish in the Sacramento Valley. A significant portion of the Clear Creek channel is in substantial sediment deficit as a result of past gravel extraction activities and blockage of upstream gravel sources by Whiskeytown Reservoir. This project is part of a larger comprehensive watershed restoration program that has been actively implementing restoration actions since 1995 to address all factors limiting production of anadromous salmonids in lower Clear Creek.

The Lower Clear Creek Spawning Injection project augments gravel resources in the Clear Creek stream channel to restore anadromous salmonid spawning and rearing habitat. The project uses an injection method that stockpiles clean, appropriately sized gravel on the stream bank. High winter flows move the gravel into the channel. This method is beneficial for its low cost and minimal environmental disturbance.

This project monitors gravel movement by photo monitoring during low-to-normal flow regimes and by radio telemetry during high flow regimes when visual observation is difficult. Six transmitters are installed in gravel rocks of various sizes at each gravel injection site to track gravel movement by telemetry. As the rocks move downstream, they are located using the signals broadcasted by the transmitters.



Western Shasta RCD Projects Manager Michael Harris records gravel monitoring data at Placer Bridge gravel injections site.

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NORTH YUBA RIVER WATERSHED IMPROVEMENT: ABANDONED MINE RECLAMATION AND RESTORATION

Sierra County Board of Supervisors



The North Yuba River.

PURPOSE

Restore watershed functions in the North Yuba River and its tributaries

PROJECT GOALS

- ✧ Reduce sedimentation
- ✧ Provide geomorphic stabilization in disturbed areas
- ✧ Improve water quality, including drinking water quality
- ✧ Foster a collaborative work group within the Watershed Council
- ✧ Increase interest in and understanding of the watershed and its resources
- ✧ Contribute to the local economy

AWARD AMOUNT

\$217,000

WATERSHED

Yuba River Watershed

COUNTY

Sierra County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 3, State Senate: 1

Benefits to the Bay-Delta System

The North Fork Yuba River is a major tributary to the Yuba River, which, in turn, is an important tributary to the Sacramento River. This project delivers both local benefits and broader public benefits of improved habitat for fish and wildlife downstream. Restoration of the mining sites in the North Fork Yuba River watershed improves water quality by reducing sediment loads, benefiting local fish and the Chinook salmon and steelhead downstream in the Yuba River. Replacing nonnative vegetation with native vegetation improves habitat for local wildlife species. The improved conditions provide greater opportunity for sport fishing and other recreational pursuits. Improved stream stability provides additional benefits by reducing maintenance costs for streamside landowners.

PROJECT OVERVIEW

The North Yuba River flows through Sierra County on the west slope of the Sierra Nevada. New Bullards Bar Reservoir is the only impoundment on the North Yuba River; above it, the river is free-flowing with no water diversions. Just downstream of New Bullards Bar Reservoir, the North Yuba River flows into the Yuba River, a major tributary to the Sacramento River and the Bay-Delta. The quality of water from the North Yuba River is an important influence on the quality of water in the mainstem of the Yuba River, which supports steelhead and fall- and spring-run Chinook salmon.

Historical mining and more recent activities have altered flows, threatened water quality, and degraded fish and wildlife habitat at abandoned mine sites in the North Yuba River watershed. Abandoned mines and roads have been shown to contribute a majority of the sediment to watercourses in the North Yuba watershed. Erosion from these sites is affecting soil productivity, hydrologic conditions, vegetation, and aquatic and riparian resources.

The Sierra County Fire Safe and Watershed Council, working as advisors to the Sierra County Board of Supervisors and composed of local residents and private property owners, has formed partnerships with industry and government representatives to lead an effort to reclaim and restore up to five inactive mine sites in the North Yuba River watershed. These sites were selected based on a number of criteria, including: availability of recent site-specific information from existing surveys, a high probability of successful outcomes, good access and visibility, and the existence of multiple resources that would benefit from the restoration. All sites involve neglected access roads, which cause undue sedimentation to nearby streams, and have been identified as having opportunities for wildlife habitat improvements.

Work at these sites includes reestablishment of natural hydrology, removal of non-eligible historic structures, stabilization of soils around abandoned roads, removal of abandoned equipment, removal and remediation of hazardous materials on site, and removal of nonnative vegetation. Restoration includes planting native vegetation, restoring meadows, enhancing hardwood and aspens, and increasing bird nesting through the installation of bird boxes. Work is being undertaken by contractors and through a volunteer partnership with the Nevada Union High School Adopt-A-Stream program.



Lower Brush Creek Mine Road project.

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PUTAH CREEK—YOLO HOUSING AUTHORITY PROJECT

Solano County Water Agency



This California black sedge estuary is a unique feature of Yolo Housing on Lower Putah Creek.

PURPOSE

Restore riparian vegetation, instream wetland, and fish spawning habitat at the Yolo Housing Authority property along lower Putah Creek

PROJECT GOALS

- ✧ Restore and enhance riparian vegetation, instream wetland, and fish spawning habitat with the combined involvement of landowners, tenants, and local agencies
- ✧ Monitor restoration efforts to assess performance
- ✧ Educate landowners and support watershed stewardship

AWARD AMOUNT

\$279,655

WATERSHED

Putah Creek Watershed

COUNTY

Solano and Yolo Counties

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 3, State Assembly: 8, State Senate: 4

Benefits to the Bay-Delta System

The Yolo Housing Authority (YHA) property is located along lower Putah Creek. This project restores riparian vegetation, instream wetland, and fish spawning habitat at the YHA property. Because the property's habitat is degraded relative to upstream and downstream areas, restoration of the site will improve the riparian corridor, which is part of a wildlife migration pathway from the north coast to the Bay-Delta. Benefits of these actions include improved habitat for fall-run Chinook salmon, steelhead, Pacific lamprey, and resident fish populations as well as migratory birds, raptors, northwestern pond turtle, valley elderberry longhorn beetle, and numerous other sensitive and common species dependent on the rare strips of riparian habitat along Central Valley waterways. Other benefits include erosion control and trash cleanup, resulting in improved water quality and community involvement, improved neighborhood relations, and educational opportunities. This project is an important step forward for a priority restoration site.

PROJECT OVERVIEW

Putah Creek's riparian corridor links the Yolo Bypass wildlife area with contiguous natural areas that extend from Lake Berryessa to Clear Lake and into the Mendocino National Forest, forming a significant wildlife migration pathway from the north coast to the Bay-Delta. The Yolo Housing Authority (YHA) property is a public housing development located along lower Putah Creek, $\frac{3}{4}$ of a mile east of the Highway 505 overcrossing of the creek. This property is degraded as a result of invasive nonnative vegetation and illegal dumping. There are more submerged tires and other debris per square foot at the YHA property than at any other location along the 23 miles of lower Putah Creek. Because the site is particularly degraded relative to upstream and downstream areas, restoration of the site will improve the riparian corridor.

This project engages local landowners and tenants of the YHA property in dialogues about trespassing and illegal trash dumping in the neighborhood and involves them in the removal of illegally dumped debris; abatement of invasive nonnative vegetation such as eucalyptus, tree-of-heaven, and Himalayan blackberry; and restoration of riparian, wetland, and Valley oak woodland plant communities and fish spawning habitat along lower Putah Creek. Creating fish spawning habitat involves installation of a boulder bar and placement of spawning gravels. The YHA project also includes monitoring aquatic invertebrates, birds, and fish. Through the physical restoration of the site, this project builds community among residents and engages them as stewards of their environment.



Legacy solid wastes will be cleaned up as part of the restoration project.

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RESTORING DEER CREEK: BUILDING PARTNERSHIPS TO OVERCOME THE LEGACY OF THE GOLD RUSH ERA

Friends of Deer Creek



Algal bloom on Lower Deer Creek. Studies are underway to determine its causes and to plan remediation actions.

PURPOSE

Improve watershed health and address the degradation of Deer Creek resulting from historical gold mining practices

PROJECT GOALS

- ✧ Describe the hydrology and geomorphology of Deer Creek
- ✧ Conduct a sediment study
- ✧ Develop a restoration plan
- ✧ Conduct water quality monitoring
- ✧ Implement erosion control projects
- ✧ Build local capacity to effectively manage the watershed

AWARD AMOUNT

\$360,000

WATERSHED

Deer Creek Watershed

COUNTY

Nevada County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 3, State Senate: 1

Benefits to the Bay-Delta System

Deer Creek is a major tributary to the Yuba River and one of the few remaining wild steelhead fisheries in the Central Valley. Implementation of this project will help benefit downstream and local communities by limiting the amount of sediment and mercury entering the Bay-Delta system and by improving water quality. These improvements will directly benefit the highly valued population of steelhead trout, Chinook salmon, and other anadromous and resident fish, as well as downstream urban water users. Improved water quality, restored streambanks, and improved ecological health of the creek will also benefit the local community and encourage its citizens to take pride in their watershed and to safely use the local watershed for recreational activities.

PROJECT OVERVIEW

Deer Creek is a main tributary to the Lower Yuba River below Englebright Dam. Rich deposits of gold were discovered in Deer Creek and the surrounding watershed in the late 1800s. As a result, Deer Creek was severely degraded and altered by gold mining activities. Following the cessation of hydraulic mining, the river incised and left behind gold mining debris and mercury deposits. Today, this material is mixed with the sediment of Upper Deer Creek, resulting in high sediment loads. The high sediment loads not only affect the instream ecology of the creek, but also contribute to heavy sediment loads in the lower Yuba River that threaten salmon and steelhead populations.

The Deer Creek watershed is now under the stewardship of a rural coalition composed of city and county governments, state and federal agencies, local nonprofit organizations, local landowners, and educational and youth groups. The intent of this coalition is to develop a restoration model for a river that flows through the center of a small Gold Country town. Restoring Deer Creek builds on work previously conducted, including the preparation of watershed assessments and identification of priority actions. This project will achieve a better understanding of the watershed by assessing the hydrology and geomorphology of the creek, analyzing the flow regime, and conducting a sediment study. This information will be added to the previous data to develop a restoration plan to improve habitat value and water quality. The restoration component of one of the project elements includes relocation of a footbridge, streambank revegetation and stabilization, and trash removal.



The Friends of Deer Creek lab, which is used for research, training, and public outreach.

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SOUTH YUBA WATERSHED PROJECT

Nevada County Land Trust



Pitcher plant bog threatened by sediment from eroded logging road.

PURPOSE

Improve water quality of the South Yuba watershed, strengthen local stewardship education programs, and foster education and sustainable forest management practices

PROJECT GOALS

- ✧ Reduce erosion and sedimentation within the South Yuba River watershed
- ✧ Build community capacity to implement forest restoration and fuel reduction projects
- ✧ Educate the public about forest ecosystems, sustainable forest management and restoration, and fire ecology
- ✧ Educate the public and schoolchildren about water quality and watershed health

AWARD AMOUNT

\$300,536

WATERSHED

Yuba River Watershed

COUNTY

Nevada County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 3, State Senate: 2

Benefits to the Bay-Delta System

The South Yuba River watershed drains into the mainstem of the Yuba River at Englebright Dam and ultimately into the Sacramento River. Improved conditions in the South Yuba provide downstream benefits to public and private users of water from the system. The extensive public outreach and education efforts of the South Yuba Watershed Project contribute to the improvement of source water quality of the Bay-Delta and reduction of sediments into Englebright Lake. Timber supply interests also benefit from improvements in the sustainability of timberlands. The South Yuba watershed community benefits from this project's financial and technical assistance for private land improvements and added protection against fire damage. This project benefits the general public by promoting watershed stewardship and sustainable forest management practices, and by reducing long-term water quality problems and fire danger.

PROJECT OVERVIEW

Flows in the South Yuba River enter the mainstem of the Yuba River at Englebright Dam and are then transported to the Feather River, the Sacramento River, and ultimately the Bay-Delta. The South Yuba River's watershed has excess fuel buildup in its forests, altered hydrology in some locations, and numerous water quality issues. Excess fuel buildup has become a major concern for forest health, water quality, human safety, and overall watershed management. Altered hydrology has increased sediment loads to the Pat Yore Flat fen system, which are detrimental to the moss and plant species living in the fen. Water quality issues include the release of mine tailings containing heavy metals, and sediment erosion from trails. Soil-borne pollutants released into local surface waters also affect the water quality of Lake Englebright.

To promote greater watershed health, the Nevada County Land Trust is implementing this project with the support of the Yuba/Bear Watershed Council, California State Parks, Tahoe National Forest, Nevada County Public Schools, Sequoia Challenge, Yuba Watershed Institute, the local resource conservation district, Bureau of Land Management, Nevada County Irrigation District, South Yuba River Citizens League, Nevada County Department of Transportation, and Sierra Pacific Industries. This project supports healthy, sustainable forests in the South Yuba River watershed through sharing the cost of an expanded fuel reduction education program with private landowners, subsidizing consulting services for private landowners, and supporting a sustainable forestry program that makes it economically feasible for landowners to practice sustainable forestry.

The community capacity for watershed and forest management is greatly enhanced by this project's multiple workshops on mature forest management, demonstrations by the Yuba Watershed Institute on natural history and forest practices, an expanded watershed education program at the Bridgeport Natural Science Center, and fire ecology workshops and demonstrations. The water quality of the South Yuba River watershed and the Bay-Delta is improved by erosion reduction in the watershed via the project's Excelsior/South Yuba Mining Canal restoration, restoration of the natural hydrology in Pat Yore Flat fen, and restoration of the abandoned Ancho Erie gold mine. In addition, the project improves watershed stewardship through extensive outreach efforts to all South Yuba watershed residents and stakeholders.



Surveying areas of erosion potential on the Independence Trail near Nevada City.

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STONY CREEK WATERSHED MANAGEMENT PLAN

Glenn County Resource Conservation District



Stony Gorge Dam near Elk Creek (Photo courtesy of Cindy Horney).

PURPOSE

Hire a watershed coordinator to bring together individuals from various backgrounds to outline a watershed management strategy that will establish protocols for conducting baseline assessments for the watershed, identify potential projects, and conduct and coordinate watershed activities.

PROJECT GOALS

- ✧ Improve public outreach and increase environmental education opportunities
- ✧ Compile and analyze existing watershed information and identify information gaps
- ✧ Identify a list of projects and methods to improve watershed conditions
- ✧ Establish a watershed monitoring program

AWARD AMOUNT

\$200,000

WATERSHED

Stony Creek Watershed

COUNTY

Glenn County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 2, State Senate: 1

Benefits to the Bay-Delta System

The Stony Creek watershed is a tributary to the Sacramento River, which is a significant water supply source to the Bay-Delta and an integral component of the Bay-Delta system. Ecosystem and water quality in the Bay-Delta is dependent on the quality of water from upstream areas. Improving the quality of discharge from Stony Creek will provide benefits to the lower Sacramento River and the Delta, including recreation, water supply, and wildlife. Improvements made within the watershed will provide recreational, water supply, and wildlife benefits to local citizens as well.

PROJECT OVERVIEW

The Stony Creek watershed includes an area of 700 square miles. It is the second largest Sacramento River tributary on the west side of the Sacramento Valley. Principal issues of concern in the watershed include altered flow regime attributable to dam operations; loss of quality stream and riparian habitat; accelerated erosion and sediment deposition; property damage from flooding and channel bank erosion; decline in wildlife, fish, and birds; and invasion of exotic plant species (primarily *Arundo donax* and *Tamarisk*). This project provides funding for a watershed coordinator to organize efforts to address these issues. The coordinator will serve as a liaison among resource agencies, landowners, and other stakeholders. Key tasks of the watershed coordinator include conducting public outreach and environmental education activities, facilitating stakeholder meetings, compiling and analyzing existing watershed information, facilitating the identification of methods to improve watershed conditions, establishing a watershed monitoring program, developing a quarterly newsletter regarding the health and opportunities for improvements of the Stony Creek watershed, and managing the existing *Arundo donax* mapping and eradication restoration project.



Picnic area at the East Park Reservoir (Photo courtesy of Cindy Horney).

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TEHAMA WEST WATERSHED ASSESSMENT

Tehama County Resource Conservation District



Forested lands in western Tehama County.

AWARD AMOUNT

\$199,500

WATERSHED

Thomes Creek and Elder Creek Watersheds

COUNTY

Tehama County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 2, State Senate: 4

PURPOSE

Conduct an assessment of the Tehama West watersheds, which include the westside tributaries of the Sacramento River between Cottonwood Creek and Stony Creek

PROJECT GOALS

Prepare a document that:

- ✧ provides a package of tools to efficiently guide implementation of watershed improvements
- ✧ helps to develop solutions that protect the resource-based economy of the region
- ✧ leads to a cooperative non-regulatory effort to improve the ecosystem in the watershed
- ✧ educates stakeholders and serves as a repository of information about the watershed

Benefits to the Bay-Delta System

The reach of the Sacramento River within this project's area is a very important spawning and rearing area for anadromous fish. The management support developed through this project will enable restoration of the creeks, providing ecosystem benefits within the watershed, in the mainstem of the Sacramento River, and for the Bay-Delta system as a whole. These could include improvements to habitat for species of special importance to the CALFED Program, including winter-run Chinook salmon and steelhead, and to the species that occupy wetland/vernal pool and riparian habitats. Reductions in the fine sediment load discharged from this watershed to the Sacramento River provide benefits to the ecosystem and to downstream water users. Local benefits include improved ecological conditions, reduced maintenance costs for local landowners, and diminished pressures on land use choices owing to improved conditions for special-status species in the watersheds.

PROJECT OVERVIEW

The creeks in the Tehama West watershed flow from the east slopes of the coast range to the Sacramento River below Red Bluff Diversion Dam. The area includes 1,440 square miles, and the principal waterways are Thomes Creek and Elder Creek. Smaller streams include Reeds, Red Bank, Coyote, Oat, and McClure Creeks. All are intermittent streams that generally dry up in the summer. The mainstem of the Sacramento River in this area contains important spawning and rearing habitat for many fish species, including the endangered winter-run Chinook salmon and steelhead. Although some of the area is federally owned, 80% of the property, a majority of which are large ranch properties and commercial timberlands, is owned privately.

Thomes Creek and Elder Creek have been identified by the U.S. Fish and Wildlife Service (USFWS) as being restorable for Chinook salmon spawning and rearing habitat. This watershed historically was a major contributor of gravel to the Sacramento River, and Thomes Creek in particular was cited by USFWS and the Department of Water Resources as a critical gravel recruitment source. Impediments to the realization of the potential of these streams as salmon habitat include: loss of riparian vegetation, the existence of nonnative invasive species such as *Arundo donax* and *Tamarix*, physical barriers to migration, and unscreened agricultural diversions. Another valuable natural resource in the watershed is a large concentration of wetland/vernal pool habitat.

The Tehama County Resource Conservation District (TCRCD) is the sponsor of this project that takes a first step toward recovery of the natural benefits of the watershed by completing a watershed assessment. The assessment documents existing conditions in the watershed through research of historical conditions and by compiling existing data on the physical and ecological resources within the watershed using a GIS system. The assessment process also provides a valuable educational tool and platform for building consensus with landowners, agencies, and stakeholders within the watershed. The TCRCD Board of Directors, staff, and a Technical Advisory Committee are reviewing this information to identify critical gaps and to identify and prioritize restoration and management efforts. This process also identifies restoration activities that will benefit other watersheds in the area and the Sacramento Valley as a whole.



Chaparral lands in western Tehama County.

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UPPER PIT RIVER WATERSHED ENHANCEMENT AND PROTECTION PROJECT/ALTURAS STORM WATER MANAGEMENT PLAN

Central Modoc Resource Conservation District



A typical summertime flow on the North Fork Pit River.

PURPOSE

Implement restoration projects to improve water quality, reduce bank erosion, restore riparian vegetation, and restore wetlands along selected reaches of the Pit River

PROJECT GOALS

- ✧ Conduct education and outreach to involve stakeholders, citizens of Alturas, and the county's Native American community in project planning
- ✧ Develop a stormwater management plan for the City of Alturas
- ✧ Reduce erosion along the X-L Ranch reach of the North Fork Pit River
- ✧ Install livestock fencing along 5 miles of the Pit River and its tributaries to protect riparian areas
- ✧ Develop restoration techniques for seasonally inundated riparian and wetland areas

AWARD AMOUNT

\$585,580

WATERSHED

Pit River Watershed

COUNTY

Modoc County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 3, State Senate: 1

Benefits to the Bay-Delta System

The Pit River watershed is one of the primary headwaters to the Sacramento River. These projects improve water quality by reducing soil erosion, thus decreasing sediment loads in the Upper Pit River and in downstream waters. This improvement benefits local fish as well as Chinook salmon and steelhead downstream in the Sacramento River. Local Native American communities and local landowners will benefit from the improvements to their property, and the entire local community benefits from the economic influx of restoration funds. Further benefits accrue to migratory waterfowl, including the greater sandhill crane.

PROJECT OVERVIEW

The Pit River watershed is one of the primary headwaters to the Sacramento River. Its waters flow through Shasta Lake and down the Sacramento River to the Bay-Delta. The Pit River is currently listed as an impaired water body for nutrients, organic enrichment, low dissolved oxygen, and temperature. Other problems include erosion, channel downcutting, sediment discharge, and excess turbidity. These adverse conditions are felt both locally and throughout the Bay-Delta ecosystem. The Central Modoc Resource Conservation District (CMRCD) has supported stakeholders to select several projects intended to increase landowner participation, demonstrate restoration techniques for other similar portions of the watershed, and complete first steps toward effective community management of the Upper Pit River. The following projects have been funded:

- ✧ The Alturas Storm Water Management Plan. Reduces chronic flooding in Alturas and identifies nonpoint source water pollution.
- ✧ The North Fork Pit/X-L Ranch Riparian Restoration Project. Addresses bank erosion that threatens a tribal cemetery and livestock management.
- ✧ The Pit River Fencing Initiative. Provides landowner incentives to establish and maintain riparian fencing programs, including offstream water development for livestock.
- ✧ The Dry Creek Basin Fence Project. Improves the management of a 6,000-foot-elevation valley that feeds into Parker Creek, a tributary to the North Fork Pit River.
- ✧ The Pit River–John and Sally Clark Riparian and Wetland Enhancement Project. Develops riparian revegetation techniques applicable to those parts of the river subject to moderate seasonal inundation as a result of irrigation impoundment.

The data and documentation generated by these sub-projects are consistent with statewide standards and coordinated with the Regional Water Quality Control Board water quality monitoring program for the Pit River. The resulting data will be made available to local interests and other entities through public meetings, reports, and posting of information and data on local and statewide websites. The CMRCD is also conducting extensive public outreach to build support and participation from citizens, and has formed a close partnership with the X-L Ranch Community of the Pit River Tribe. Community education and outreach efforts focus on the urban watershed issues found in Alturas, as well as on inclusion of the county's Native American community in watershed planning and management.



Central Modoc RCD Crew installing a brush barb on the Pit River near Alturas.

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UPPER SPANISH CREEK WATERSHED ASSESSMENT AND RESTORATION STRATEGY

Plumas Corporation



Collecting substrate and flow data on Spanish Creek.

PURPOSE

Develop a detailed watershed assessment and restoration strategy for Spanish Creek

PROJECT GOALS

- ✧ Develop a watershed assessment
- ✧ Develop a restoration strategy to stabilize bank erosion
- ✧ Establish riparian habitat
- ✧ Build community capacity for effective watershed management

AWARD AMOUNT

\$170,000

WATERSHED

Spanish Creek Watershed

COUNTY

Plumas County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 3, State Senate: 1

Benefits to the Bay-Delta System

Spanish Creek is a tributary to the Feather River, which is the major water supply basin for the State Water Project and an integral component of the Bay-Delta system. Ecosystem and water quality within the Bay-Delta is dependent on the quality of water from upstream areas. Stabilization of Spanish Creek will:

- ✧ reduce sediment load and the transport of other contaminants, such as nitrogen and phosphorus, from entering the Feather River and Bay-Delta system, thereby providing multiple benefits to water users and the general public;
- ✧ prevent the loss of property for creekside landowners;
- ✧ build community capacity to assess and effectively manage the watershed; and
- ✧ encourage technology transfer and information sharing within the watershed management community.

PROJECT OVERVIEW

The Spanish Creek watershed is located in the northern Sierra Nevada Mountains and is a tributary to the Upper North Fork Feather River. The Feather River contributes a major portion of runoff flow to the Sacramento River. Over the years, the banks of Spanish Creek have become unstable largely as a result of historical hydraulic mining and channelization projects. The creek was used as a commercial gravel source in the 1960s. Since operations ceased in the mid-1990s, sediment buildup has caused mid-channel sandbars to form, changing the flow of Spanish Creek and resulting in the loss of land for creekside landowners.

To address these issues, landowners along Spanish Creek are working together with the Feather River Coordinated Resource Management Group, an alliance of natural resource management agencies, local landowners, private interests, and the public, to develop a watershed assessment and design long-term effective management practices. Rather than individual landowners attempting to fix their own portions of the streambank, and thus transferring the problem to their neighbors, they have agreed to participate in a coordinated approach and assess the problem as a whole by examining the entire channel. This project calls for a thorough scientific study of the Spanish Creek watershed to quantify river geomorphology, flow, and sediment characteristics. From this study, a comprehensive restoration strategy for Spanish Creek will be developed. The restoration strategy will focus on reducing excess erosion and sedimentation from the watershed. This project also educates the community to help build its capacity to collaborate and participate in effective watershed management and restoration activities.



Vertical banks such as this one on Spanish Creek are eroding riparian habitat and property and contributing to water quality degradation.

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UPPER TRINITY RIVER WATERSHED MANAGEMENT PLANNING PROJECT

Trinity County Resource Conservation District



Alpine lakes store the winter snowmelt that feeds the entire watershed.

AWARD AMOUNT

\$200,000

WATERSHED

Upper Trinity River Watershed

COUNTY

Trinity County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 2, State Senate: 4

PURPOSE

Develop a watershed assessment and action plan to address the high levels of sedimentation and turbidity in the Upper Trinity River watershed

PROJECT GOALS

- ✧ Minimize sedimentation and turbidity
- ✧ Improve water quality and water supply reliability
- ✧ Improve fish habitat

Benefits to the Bay-Delta System

Nearly 1 million acre-feet of water per year is diverted from Trinity Lake into the Bay-Delta system, making the Upper Trinity River an important source watershed to the system. This project provides the necessary planning needed to:

- ✧ improve water quality and water supply reliability for downstream urban and agricultural water users by reducing sedimentation and turbidity in the Upper Trinity River watershed,
- ✧ reduce erosion of silts and sands that impair the quality of spawning gravels for anadromous fish, and
- ✧ improve recreation and tourism opportunities for the local community by improving water quality and supply.

PROJECT OVERVIEW

The Upper Trinity River watershed has a drainage area of 692 square miles that includes Trinity Lake. Water is diverted regularly from Trinity Lake into the Bay-Delta system, which provides 2.5 million acre-feet of storage for the Central Valley Project. The upper watershed has been heavily logged. In heavy rainfall years, large volumes of fine sediment are eroded from the watershed upstream of Trinity Dam and are flushed into the lake, reducing its storage volume. Water exports from the dam to the Sacramento River can experience extremely high turbidity levels during heavy rainfall years. The buildup of sediment in Trinity Lake reduces the available storage capacity that can shorten the expected life of the dam. The seriousness of the sedimentation issue has led the Trinity County Resource Conservation District to develop the Upper River Trinity River watershed Management Planning Project.

The overall objective of this community-based project is to develop a comprehensive watershed plan for the Upper Trinity River using a collaborative approach. Included in this process are the following activities:

- ✧ Form a new community-based watershed group entitled “Upper Trinity River Watershed Team”
- ✧ Conduct a sediment-source inventory
- ✧ Prepare a strategic fuels reduction and thinning plan and demonstration project
- ✧ Develop a comprehensive watershed assessment and action plan



One key to watershed planning is learning about the resources from the landowners.

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WATER QUALITY IMPROVEMENT IN COW CREEK WATERSHED

Western Shasta Resource Conservation District



Upper South Cow Creek water quality monitoring site.

PURPOSE

Improve water quality in the Cow Creek watershed

PROJECT GOALS

- ✧ Identify the sources of known water quality problems, fecal coliform contamination, and elevated water temperatures, in the Cow Creek watershed
- ✧ Obtain baseline temperature data and fecal coliform data
- ✧ Determine options to remedy the water quality problems in the watershed
- ✧ Develop an implementation plan to address water quality issues
- ✧ Conduct a water quality monitoring program on Cow Creek

AWARD AMOUNT

\$67,160

WATERSHED

Cow Creek Watershed

COUNTY

Cow Creek Watershed

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2, State Assembly: 2, State Senate: 4

Benefits to the Bay-Delta System

Cow Creek is an eastside tributary to the Sacramento River, below Keswick Dam. Project-related improvements will reduce fecal coliform levels and lower water temperatures in the watershed. This will have direct benefits to stakeholders in the watershed, including improvements to municipal and domestic water supply, irrigation, stock watering, hydroelectric power generation, and contact and non-contact recreation. Lowering water temperature conditions in the watershed will also contribute to better conditions for Chinook salmon and steelhead by providing improved spawning habitat and migration for anadromous fisheries, and other habitat improvements. This project continues the collaborative efforts of agencies, landowners, and tribal interests to address problems in the Cow Creek watershed.

PROJECT OVERVIEW

The Cow Creek watershed drains approximately 274,000 acres in Shasta County. Cow Creek is an eastside tributary to the Sacramento River, downstream of Keswick Dam, and is thus directly connected to the Bay-Delta. Water quality studies have identified high levels of fecal coliform in several of the main tributaries to Cow Creek and in Cow Creek. Elevated levels of fecal coliform prevent waters from being used for contact recreation, municipal and domestic water supply, and other beneficial uses.

In addition, previous studies have identified water temperatures exceeding preferred developmental thresholds for coldwater fish species. Such high temperatures have repeatedly been identified as limiting factors for species such as Chinook salmon and steelhead on Cow Creek.

This project includes monitoring fecal coliform levels in tributaries with known problems, as well as in the mainstem of Cow Creek. A technical advisory team will review results and develop remediation recommendations. Monitoring includes field temperature testing and evaluation of data to narrow sources and causes of elevated temperature, as well as an analysis of project feasibility to help lower temperatures in priority areas. Results will support the implementation of restoration activities in the Cow Creek watershed.



"Tidbit" sensor used in water quality monitoring on Cow Creek.

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YUBA RIVER CITIZEN MONITORING PROGRAM—PHASE II

South Yuba River Citizens League



The North Yuba River below Downieville.

AWARD AMOUNT

\$215,000

WATERSHED

Yuba River Watershed

COUNTY

Nevada County

CALFED REGION

Sacramento Valley Region

LEGISLATIVE DISTRICTS

US Congress: 2 and 4,

State Assembly: 3 and 4, State Senate: 1

PURPOSE

Expand a successful volunteer monitoring program in the Yuba River watershed and use the data to evaluate effectiveness of previous work and report on water quality

PROJECT GOALS

- ✧ Design and execute scientifically credible studies to assess Yuba River conditions
- ✧ Empower and educate citizens to be responsible stewards and decision-makers
- ✧ Screen for water quality problems
- ✧ Identify pollution sources
- ✧ Evaluate the effectiveness of restoration and management practices
- ✧ Evaluate the quality of water compared to specific water quality criteria
- ✧ Conduct a conference on monitoring by citizens
- ✧ Produce a handbook on the “how to’s” of monitoring by citizens

Benefits to the Bay-Delta System

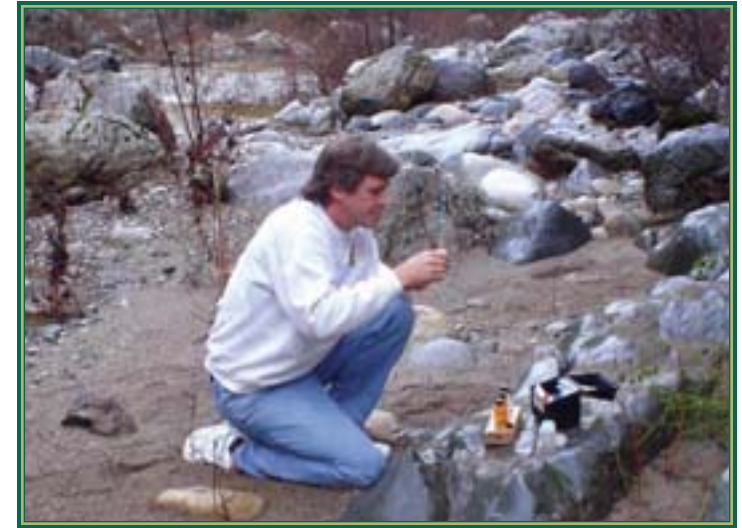
The Yuba River supports highly valued populations of steelhead trout and Chinook salmon. The river’s wild steelhead fishery is significant. The Yuba River historically supported 15% of the annual fall-run Chinook salmon in the Sacramento River system. In addition, the health of the watershed is critical to downstream urban water users who depend on the Yuba River for their drinking water. Implementation of this project:

- ✧ facilitates more informed decision-making by continuing to conduct water quality monitoring of the various parameters that can affect humans and fish in the Bay-Delta system and
- ✧ encourages continued collaboration by sharing the data compiled through this project with 13 local, state, and federal agencies, and seven restoration and planning efforts in the Yuba River watershed.

PROJECT OVERVIEW

The Yuba River is one of the most diverted and dammed rivers in the Sierra Nevada. Its 1,325 square miles of watershed is a source of drinking and irrigation water for hundreds of thousands of consumers. During summer months, more than 95% of normal flows can be diverted out of the middle and south forks of the Yuba for delivery to Placer County residents. Damage from historical mining practices continues to degrade Yuba River water quality with the accumulation of mercury, arsenic, and other pollutants in sediment behind reservoirs and in riverbeds.

The Yuba River Citizen Monitoring Project was initiated in 2000 to address the degraded water quality in the watershed. The Monitoring Project has become a successful, collaboratively developed, watershed-wide monitoring and assessment program. Phase I of the project included the services of more than 65 trained citizen volunteers and 21 monitoring sites throughout the Yuba River watershed. Data on a variety of parameters, including pH, dissolved oxygen, water temperature, arsenic, iron, copper, zinc, mercury, and flow, have been compiled at the monitoring sites on a monthly basis since October 2000. This project—Phase II of the Yuba River Citizen Monitoring Program—expands the program to include additional parameters and sites that are relevant to new or forthcoming resource issues. Phase II monitors six additional parameters (lead, chromium, enterococci bacteria, turbidity, nitrogen, and phosphate), increases the number of monitoring locations to include eight new monitoring sites, and continues an investigation into the extent and causes of enterococci contamination in the Yuba River. Additionally, this project will help build the capacity of other volunteer monitoring programs by developing curriculum and materials for a Citizens Monitoring Academy.



Dissolved oxygen sampling on the South Yuba River in December 2004.

CONTACT INFORMATION

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